EVIDENCE FOR THE L-CHONDRITE PARENT BODY BREAKUP EVENT? COSMIC-RAY EXPOSURE AGES OF 480 MYR OLD FOSSIL METEORITES. Ph. R. Heck[1], H. Baur[1], B. Schmitz[2] and R. Wieler[1], [1]Isotope Geology, NO C61, ETH, CH-8092 Zürich Switzerland, heck@erdw.ethz.ch, [2]Marine Geology, Earth Science Centre, P.O. Box 460, SE-405 30 Göteborg, Sweden, birger@gvc.gu.se

Introduction: Schmitz et al. [1] estimated the meteorite flux 480 Ma ago to have been one to two orders of magnitude higher than today. Debris from the collisional breakup of a L-chondrite parent body in the asteroid belt may have generated the elevated flux.

In a preliminary study [2] we have shown that cosmic-ray produced noble gases have been quantitatively retained in chromite grains of a fossil ordinary chondrite (Golvsten 001) during 480 myr of shallow burial in marine limestone in southern Sweden [2]. The calculated exposure age is surprisingly low compared to present day chondrites. At the meeting we will present exposure ages of fossil meteorites from different stratigraphic positions of the same location.

Samples and Experimental: The meteoritic chromite grains were not significantly affected by diagenesis although the other mineral phases were completeley altered [1]. Chromite grains were extracted from the fossil meteorite as described in [2]. A continuous-wave Nd-YAG laser was used to melt the grains in ultra-high vacuum. The measurement was made using an ultra-high sensitivity mass spectrometer with a compressor ion-source [3].

The gas amounts were calibrated by measuring olivine fragments from the pallasite Admire. Exposure ages were calculated using elemental production rates by Leya et al. [4] and average chemical composition of the chromites [1].

Results: All relict chromite grains from the meteorite Golvsten 001 contain excesses of cosmogenic ^{3}He and ^{21}Ne, and the contribution of terrestrial cosmogenic nuclides ($<10^{-3}$%) and nucleogenic isotopes (~1.5%) can be neglected [2]. The calculated exposure ages on the order of ~300 kyr are unusally short for ordinary chondrites. Exposure ages from other meteorites of different stratigraphic locations will be presented at the meeting.

Discussion: If the low age is confirmed by our new measurements the meteorites have arrived on Earth shortly after their release from the parent body. This might be consistent with dynamical modelling suggesting that during a major asteroid breakup event about 10% of the fragments produced will arrive on Earth within the first million years [5]. The new data will allow us to rule on the alternative hypothesis that the young nominal age of Golvsten 001 is due to high shielding in an unusually large meteoroid.

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